

Wave Power

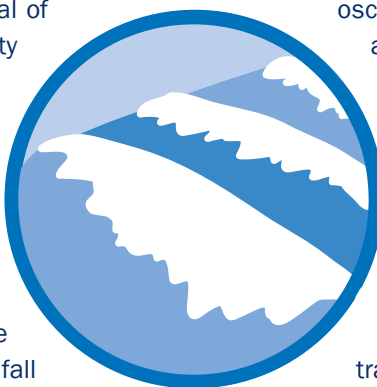
U.S. Environmental Protection Agency • July 2002

www.epa.gov/ne

Wave Power

The U.S. Department of Energy has estimated the total energy generating potential of waves breaking on the world's coastlines at two to three million megawatts. Favorable locations can average a potential of 65 megawatts per mile of coastline. Electricity from wave power generates none of the air or water pollution associated with electricity generated from traditional fossil fuel sources such as coal, oil, or natural gas. There are currently three approaches to capturing wave energy:

- Oscillating Water Columns generate electricity from the wave-driven rise and fall of water in a cylindrical shaft. This technology is currently the most commercially viable, and the one targeted for several demonstration projects in the U.S. and Canada.
- Floats or Pitching Devices generate electricity from the bobbing or pitching action of a floating object.
- Wave Surge or Focusing Devices generate electricity by channeling waves into an elevated reservoir. Water then flows out of the reservoir and generates electricity using conventional hydro-power technologies.



There are currently several sites along the Massachusetts and Maine coastlines being evaluated for the siting of demonstration projects in 2002 and 2003, using the oscillating water column technology discussed above. These systems are designed to produce from 100 kW to 1 MW of electricity, depending on the wave conditions. The power from these sources is considered intermittent, like wind and solar, and is only generated when there is adequate wave action. The installations have footprints ranging from 1,000 to 2,500 square meters, excluding any onshore infrastructure associated with electric transmission, such as a substation. For comparison, a football field is approximately 5,000 square meters. Power generated from these facilities is still relatively expensive to produce and averages about 10 to 15 cents per kWh. The expectation is that, like wind power, costs will come down with time as the technology improves and more facilities are installed.

Wave Power in New England

Many sites along the New England coast have characteristics that make them suitable candidates for wave power facilities. Open exposed coastlines with regular and unobstructed wave action are ideal. Semi-enclosed bodies of water such as Long Island Sound are not appropriate for this technology.



1 Congress Street
Suite 1100
Boston, MA 02114

EPA Energy Team Contact:

John Moskal
617-918-1826
moskal.john@epa.gov